



Al Rose, P.E.

Sr. Design Engineer

Sr. Forensic Engineer

Pipe Failure Expert

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- **500+** forensic engineering cases, \$100 Million+ in cases involving nearly every kind of pipe and tubing found in residential, commercial, and industrial applications
- Designed piping in **every state** in the U.S for large chemical, petroleum, and wastewater plants
- **30 years'** experience in design and failure analysis of pipes
- Performed **thousands** of computer simulations and stress analyses
- Led dozens of successful **R&D Projects** involving piping components
- **Installed** commercial and residential pipe
- **Top-Level Customer Service and Response**

Mr. Rose is an industry expert in pipe failure analysis, possessing a rich background in design, failure analysis, material science, expert testimony, and investigative skills. He is proficient in forensic modeling, having performed thousands of computer simulations and stress analyses. He has lectured at universities and provided continuing education, possessing the ability to explain complex matters in simple terms to students, juries and arbitrators. He combines his 30 years of experience in design engineering, R&D, field studies, forensic engineering, failure analysis, computer simulation, teaching, and hands-on experience to provide a uniquely qualified expert witness in pipe failure claims and litigation.

Licenses and Certifications:

Professional Engineer, AZ, #33697

Professional Engineer, NV, #023733

Professional Engineer, NM, #19888

Professional Engineer, CA, #31135

Professional Engineer, CO, #44123

Professional Engineer, UT, # 10183449-2202

Court Qualifications/ Depositions:

State Farm v. Hague Water Quality, Failed Water Softener
Pima County Court, AZ, Case C2010-7809

Chartis Property Casualty Company v. Aquazona Aquarium Services
Maricopa County Court, AZ Case No. CV2011-005321.

Great Northern Insurance Company v. Haselden Constructors, LLC
US District Court for the District of Colorado, Civil Action No. 12-cv-00435-RPM-MJW

Raymond Heffley v. St. Joan of Arc Roman Catholic Parish Phoenix
Maricopa County Court, AZ Case No. CV2011-053198

Sentinel Insurance Company v. CSW Plumbing, Flexcon Industries,
Arizona State Superior Court, Maricopa County, Case CV2013-051203

Metropolitan Property & Casualty Insurance Co. v. Best Buy, LG, DMT USA
US District Court for the District of Arizona, Case 4:12-cv-00655-TUC-CKJ

Harry Williams v. Loew's Crown Isle Marina
Superior Court of California, Case 37-2015-00009822-CU-BC-CTL

State Farm v. Ecowater Systems
Arizona State Superior Court, Maricopa County, Case CV2013-00793

Chako V. Oregon Precision Industries, Costco
California State Superior Court, County of Los Angeles, Case BC643721

Affiliations:

American Society of Mechanical Engineers (ASME), former Vice President, AZ ASME
The Materials Information Society (ASM), former member, lecturer
National Fire Protection Association, former member

Courses Instructed/ Guest Lecturer:

Diagnosing Material Failures, ASME Certified Class, University of Arizona, 2011
Portable Affordable Failure Analysis, University of Arizona, 2011
Forensic Engineering, University of Arizona, 2011
Fractography, University of Arizona, 2015

Professional Experience:

Pipe Failure Expert, Arizona Forensic Engineering Investigations, 2008-Present
EFI Global, Sr. Forensic Mechanical Engineer, 2008 – 2019
Innovative Engineering Solutions, Chief Design Engineer, 2003 – 2008
Parkson Corporation, Senior Design Engineer, Head of R&D, 1996 – 2002
Parkson Corporation, Design Engineer 1994 – 1996; Project Engineer, 1990 – 1994

Education:

Bachelor of Science, Mechanical Engineering, University of Florida, Gainesville, FL 1989

Continuing Education:

Process Piping: The Complete Guide to ASME B31.3 - Becht
Handbook of PVC Pipe – Unibell
Handbook of PE Pipe – Plastics Pipe Institute (PPI)
PE Piping Systems Field Manual for Municipal Water Applications - PPI
Trenchless Technology Piping – ASCE
Buried Pipe Design – Moser
Piping Systems Manual – Silowash
Piping and Pipeline Assessment -Escoe
Pipeline Integrity Handbook - Risk Management and Evaluation - Singh
Piping and Piping Calculations Manual - Ellenberger
Piping Handbook – Nayyar
Pipe & Excavation Contracting -Roberts
Plastic Pipe Systems: Failure Investigation and Diagnosis – Farshad
Plastic Piping Handbook – Willoughby
Plastic Pipe Failure, Risk, and Threat Analysis – Gas Technology Institute
Diagnostics and Reliability of Pipeline Systems – Timashev
Pipeline Planning and Construction Field Manual – Menon
The Planning Guide to Piping Design – Beale
Piping Materials Guide – Smith
Pipe Stress Engineering – Peng
Piping Calculations Manual – Menon
Piping and Pipe Support Systems: Design and Engineering - Smith



Analysis of Pipeline Steel Corrosion Data - NIST
All In One Manual of Industrial Piping Practice and Maintenance - Murty
Reliability and Maintainability of In-Service Pipelines - Mahmoodian
Oil & Gas Pipelines and Piping Systems: Design, Construction, Management, and Inspection - Bahadori
Handbook of Double Containment Piping Systems - Ziu
Concrete Pipe Design Manual – American Concrete Pipe Association
Industrial Piping Practice and Maintenance – Murty
Trenchless Technology Piping Installation and Inspection – Najafi
Pipe Excavation Contracting - Roberts
Pipe Fitters & Welder Pocket Manual – Audel
Pipeline Rules of Thumb Handbook - McAllister
Defects and Failures in Pressure Vessels and Piping - Thielsch
Nalco Water Handbook – Nalco Chemical Company
The Nalco Guide to Cooling Water Systems Failure Analysis – Nalco
The Nalco Guide to Boiler Failure Analysis – Nalco
Inspection, Testing, and Maintenance of Water Based Fire Protection Systems – NFPA 25
Corrosion Control for Buried Water Mains - Romer
Corrosion of Polymers and Elastomers – Schweitzer
Corrosion Engineering – Roberge
Principles in Corrosion Engineering and Corrosion Control – Ahmad
Fundamentals of Metallic Corrosion – Schweitzer
The Corrosion of Copper and its Alloys – Francis
Corrosion Resistance of Copper and Copper Alloys
Corrosion Atlas - During
Corrosion of Linings and Coatings – Schweitzer
Failure Analysis of Paints and Coatings – Weldon
Forms of Corrosion Recognition and Prevention – NACE
Metallurgy – Moniz
Practical Metallurgy and Materials of Industry – Neely
Metallurgical Failures in Fossil Fired Boilers –French
Design of Weldments – Blodgett
Design of Welded Structures – Blodgett
Steel Buildings: Analysis and Design – Crawley
Deformation and Fracture Mechanics of Engineering Materials – Hertzberg
Failure Analysis of Engineering Materials – Brooks
Metals Handbook Vol. 12 - Fractography – ASM
Fatigue & Fracture Reliability Engineering - Xiong
Fracture Mechanics - Gross
Theory of Elastic Stability – Timoshenko
Buckling of Shells and Shell-Like Structures - Buchert
Atlas of Polymer Damage - Lothar Engel
Failure of Plastics and Rubber Products – Rapra Technology
Failure Analysis of Plastics - Vishu
Fractography of Rubbery Materials – Bhowmick
Structural Plastics Selection Manual – ASCE
Engineering Plastics – ASM
Fractography – Hull
Plastics Failure Guide – Ezrin
Effect of Temperature and Other Factors on Plastics and Elastomers – McKeen
Fatigue & Tribological Properties of Plastics & Elastomers – McKeen



The Effect of Creep and Other Time-Related Factors on Plastics and Elastomers - McKeen
Fractography in Failure Analysis of Polymers - Ebnesajjad
Environmental Stress Cracking of Polymers - Wright
Injection Molding Troubleshooting - Carender
Fiber Composites – Mallick
Mechanics of Composite Materials –Kaw
Failure Analysis and Fractography of Polymer Composites - Greenhalgh
Dynamic Failure of Composite and Sandwich Structures - Abrate
Fatigue Damage in Composite Materials - Revuelta
Failure Criteria in Fiber Reinforced Polymer Composites - Hinton
Structural Analysis of Thermoplastic Composites – Trantina
Handbook of Plastics Testing Technology –Shar
Advanced Topics in Characterization of Composites – Kessler
Polymer Surfaces –Cherry
Handbook of Acrylics for Submersibles, Hyperbaric Chambers and Aquaria - Stachiw
Practical Plant Failure Analysis – Sachs
Practical Machinery Management for Process Plants - Bloch
Facility Managers Maintenance Handbook - Payan
Failure Modes & Failure Mechanisms - Daley
Cooling Water Problems & Solutions - Bhatia
Pressure Vessel Design Handbook – Bednar
Wastewater Treatment Plants – Qasim
Water Treatment Principles & Design – Montgomery
Open Channel Flow - Chaudhry
Concrete Fracture Models and Applications - Kumar
High Pressure Boilers –Frost
Low Pressure Boilers Steingress
Boiler Operator’s Guide - Spring
Petrochemicals – Burdick
Oil and Gas Exploration and Production –Favenne
Solders and Soldering - Manko
Failure Analysis of Industrial Composite Materials –Gdoutos
Material and Component Failure, Failure Analysis, and Litigation – Murr
Fractography of Ceramics & Glasses - NIST
Structural Adhesive Joints in Engineering – Adams
Seals and Sealing Handbook – Warring
Handbook of Fluid Sealing – Brink
Harris’ Shock and Vibration Handbook – Piersol
Mechanical Vibrations – Hartog
Introduction to the Design and Behavior of Bolted Joints– Bickford
Fire Protection Handbook –NFPA
Automatic Sprinkler Systems Handbook – NFPA
Kirk’s Fire Investigation – DeHaan
Electrical Failure Analysis for Fire & Incident Investigations - Durham
Fire Dynamics Series: Fire Protection Fundamentals - Marchetti
The Engineer in the Courts - Conner
Products Liability and Safety – Owen
Products Liability - Phillips
Human Factors in Forensic Analysis of Accidents – Chen